Massachusetts Division of
Health Care Finance and Policy

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Do Medicaid Patients Use More Inpatient Resources?

ANALYSIS IN BRIEF

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Summary: *On average, Medicaid patients use fewer hospital inpatient resources than non-Medicaid patients. Medicaid patients have substantially lower ancillary charges, but higher routine hospital charges because of their typically longer lengths of stay. These differences are mainly due to the fact that Medicaid patients tend to be younger and have a less costly hospital case mix. Moreover, Medicaid patients tend to use fewer resources for childbirth-related DRGs, but more resources for both medical/surgical and mental health/substance abuse DRGs. These differences in resource use are more substantial for mental health/substance abuse DRGs.*

Facing rapid medical inflation and slow economic growth, Massachusetts, like many other states, is experiencing serious financial pressure on government programs, especially Medicaid. To minimize the pressure on reducing covered populations and cutting benefits, the Commonwealth must explore strategies to control costs and manage its Medicaid program efficiently. Although the share of Medicaid expenditures on hospital care has declined over time, that share still accounts for at least 17% of total Medicaid spending in Massachusetts, the second largest area of spending after nursing home expenditures.[1] Controlling hospital spending is an important opportunity for Massachusetts to control total Medicaid spending.

Massachusetts hospitals have faced serious financial difficulties in recent years, and have put pressure on all payers to increase rates. Medicaid represents only 10% of total hospital revenues,[2] but because Massachusetts hospitals have been unable to cost shift to other payers in recent years, there has been a heated debate as to whether the state should increase its Medicaid rates. Much of the debate has focused on how to allocate the costs for which the Medicaid program is responsible, and particularly whether Medicaid patients consume more hospital resources than non-Medicaid patients.

This study compares Medicaid hospital cases with non-Medicaid hospital cases to determine whether Medicaid patients use more hospital inpatient resources. First, average resource use was compared on a per hospital case basis. This aggregate analysis provides an overall picture of the issue. Second, in order to help understand the differences in resource use, Medicaid and non-Medicaid patients were compared under similar conditions. This second analysis controlled for patients' demographic characteristics and the characteristics of the hospitals to which they were admitted within Diagnostically Related Groups (DRGs). These DRG specific analyses, in which patient and hospital factors were controlled, provide useful information on the differences in resource use across different types of DRGs.

Study Population

Discharge data from Massachusetts acute care hospitals for FY99 were used in this study. The data analyzed were based on 458,041 non-Medicare hospital cases. Outlier cases were excluded using a standard statistical approach, i.e. three standard deviations above the mean of the study population. This approach resulted in 5,625 hospital cases with charges per case above $78,372 excluded from the analysis.[3] Cases with zero charges (n=146) were also deleted. These two further exclusions represent 1.26% of the non-Medicare hospital cases. They are fairly balanced between Medicaid (the excluded 1,193 cases represent 1.32% of the original Medicaid population) and non-Medicaid (the excluded 4,578 cases represent 1.25% of the original non-Medicaid population). The remaining study population had 89,193 Medicaid cases (including both fee-for-service and managed care) and 363,077 non-Medicaid cases.

Table 1: Characteristics of the Study Population (FY99)

Characteristics	Medicaid	Non-Medicaid	Difference (p>|t| or ChiSq)
Age (Mean)	26.6	33.6	-7.0 (0.000)
Sex (Male)	37.1%	41.5%	-4.4% (0.000)
Race (White)	55.3%	80.5%	-25.2% (0.000)
Teaching Hospital	48.4%	50.5%	-2.1% (0.000)
DSH	7.8%	3.8%	4.0% (0.000)
Total Cases	**89,193**	**363,077**	

Note: The disproportionate share hospitals (DSH) include Boston Medical Center and Cambridge Health Alliance (Cambridge Hospital and Somerville Hospital).

Medicaid patients on average were seven years younger than non-Medicaid patients (see Table 1 above). They were also less likely to be male and white. While Medicaid patients were more likely to use disproportionate share hospitals (DSH) than non-Medicaid patients, they were slightly less likely to use teaching hospitals. All of these differences are statistically significant.

Overall Hospital Resource Use

This study used hospital charges as a proxy for resource use, since comparable measures of hospital costs are unavailable. In this aggregate analysis, per case differences in total hospital charges, ancillary charges, routine charges, and hospital length of stay between Medicaid patients and non-Medicaid patients were compared and tested. These measures were further adjusted to control for case mix differences. The Case Mix Index (CMI) was 0.76 for Medicaid and 0.86 for non-Medicaid.[4]

The average total hospital charge per case for Medicaid was $1,135 lower than for non-Medicaid. The difference in case mix adjusted average charge per case was only $135, but remained statistically significant (see Table 2 above).

When total hospital charges were categorized into two major components, the average ancillary charges for Medicaid cases were $1,590 lower than for non-Medicaid cases, but routine charges were $486 higher. These differences remained statistically significant even after controlling for case mix differences. Therefore, on average, Medicaid patients had lower treatment-related hospital charges, while their room and board related hospital charges were higher. This is consistent with the finding that the average length of stay for Medicaid cases was three quarters of a day longer than for non-Medicaid cases, and case mix adjusted length of stay was just over one and a half days longer.

DRG-Specific Regression Analyses

The top 20 Medicaid DRGs were selected for further analysis. These 20 DRGs accounted for 53% of all Medicaid hospital discharges in FY99. Multivariate regression analyses were conducted on average hospital charges per case and average length of stay for each of the DRGs. The analyses control for the impact of five factors (age, sex, race, teaching hospital, and disproportionate share hospital) in addition to the payment source, i.e. Medicaid versus non-Medicaid. The study results were organized into three DRG groups: childbirth related DRGs (nine DRGs), medical/surgical related DRGs (six DRGs), and mental health/substance abuse related DRGs (five DRGs).

Table 2: Hospital Inpatient Resource Use, Medicaid versus Non-Medicaid Cases (FY99)

	Medicaid	Non-Medicaid	Difference (p>|t|)
Total Charges			
Unadjusted	$7,723	$8,858	-$1,135 (0.000)
Case mix adjusted	$10,154	$10,289	-$135 (0.003)
Ancillary Charges			
Unadjusted	$4,309	$5,899	-$1,590 (0.000)
Case mix adjusted	$5,666	$6,851	-$1,185 (0.000)
Routine Charges			
Unadjusted	$2,936	$2,450	$486 (0.000)
Case mix adjusted	$3,860	$2,846	$1,014 (0.000)
Length of Stay (Days)			
Unadjusted	4.46	3.70	0.76 (0.000)
Case mix adjusted	5.87	4.29	1.58 (0.000)
Case Mix Index (CMI)	0.76	0.86	-0.10 (0.000)

The results among these three groups of DRGs present two different patterns (see Table 3 on page 3). For childbirth-related DRGs, Medicaid cases had lower hospital charges (statistically significant for five out of nine DRGs), and shorter length of stay than non-Medicaid cases (statistically significant for two out of nine

Table 3: Regression Results on Hospital Resource Use for Top 20 Medicaid DRGs (FY99)

DRG		Total Cases		Average Charges			Average Length of Stay (Day)		
		Medicaid	Non-Medicaid	Medicaid	Non-Medicaid	Medicaid Effect (p>|t|)	Medicaid	Non-Medicaid	Medicaid Effect (P>|t|)
Childbirth									
629	Neonate w norm	14,639	56,604	$1,323	$1,420	-$56 (0.00)	2.31	2.43	-0.06 (0.00)
373	V Delivery w/o cc	9,482	35,176	$4,009	$4,364	-$127 (0.00)	2.15	2.20	-0.03 (0.00)
372	V Delivery w cc	3,124	11,493	$5,385	$5,629	-$152 (0.00)	2.84	2.78	0.00 (0.90)
371	C Section w/o cc	1,941	10,192	$7,034	$7,276	-$135 (0.00)	4.01	4.07	-0.03 (0.09)
627	Neonate w major problem	803	1,822	$7,494	$7,719	$318 (0.13)	6.33	4.75	0.93 (0.00)
383	Antepartum diagnoses	790	1,611	$5,020	$5,332	-$61 (0.64)	3.20	3.09	0.12 (0.14)
628	Neonate w minor problem	753	1,992	$4,411	$4,483	$53 (0.71)	3.80	3.70	0.07 (0.38)
374	V Delivery w sterilization	670	1,033	$6,714	$7,379	-$260 (0.01)	2.31	2.47	-0.04 (0.20)
370	C Section w cc	616	1,932	$9,773	$8,956	$275 (0.10)	4.83	4.74	0.03 (0.68)
Medical and Surgical									
775	Asthma	1,161	2,310	$3,792	$3,554	$170 (0.00)	2.44	2.09	0.16 (0.00)
88	COPD	1,020	2,853	$7,098	$6,469	$320 (0.00)	4.62	4.17	0.30 (0.00)
143	Chest pain	848	3,820	$4,866	$4,490	$212 (0.00)	1.92	1.57	0.18 (0.00)
89	Pneumonia	778	2,983	$7,655	$7,268	$212 (0.09)	4.72	4.50	0.19 (0.18)
359	Uterine procedure	723	7,284	$8,532	$8,660	-$2 (0.97)	2.78	2.50	0.14 (0.00)
204	Disorder of pancreas	667	1,738	$6,842	$7,045	-$130 (0.31)	4.48	4.06	0.24 (0.00)
Mental and Substance Abuse									
430	Psychosis	6,220	9,568	$10,312	$8,765	$640 (0.00)	9.83	8.46	0.68 (0.00)
745	Opioid abuse w/o cc	926	1,909	$4,642	$6,689	$20 (0.76)	5.31	4.23	0.34 (0.00)
427	Neuroses w/o depressive	880	934	$8,279	$6,000	$751 (0.00)	8.03	5.39	0.99 (0.00)
751	Alcohol abuse	805	2,613	$4,404	$4,333	$124 (0.03)	5.77	4.06	0.81 (0.00)
426	Depressive neuroses	752	1,282	$6,386	$4,903	$613 (0.00)	6.37	4.58	0.82 (0.00)

Note: The Medicaid effects are based on the DRG specific multivariate regression for which additional patient demographic factors (age, sex, and race) and hospital factors (teaching and DSH) are controlled.

DRGs, except for a longer length of stay for one DRG). For both medical/surgical DRGs and mental health/substance abuse DRGs, Medicaid patients had higher total charges (statistically significant for 7 out of 11 DRGs) and a longer length of stay (statistically significant for 10 out of 11 DRGs). The differences in resource use were more substantial for mental health/substance abuse DRGs than for medical/surgical DRGs.

These regression results suggest that after controlling for patients' demographic factors and hospital factors, Medicaid patients tended to use fewer hospital resources than non-Medicaid patients for childbirth-related cases, but more hospital resources for medical/surgical cases and mental health/substance abuse cases. Medicaid patients' use of more hospital resources was associated with their longer hospital stays.

Conclusions and Policy Implications

On average, Medicaid patients used fewer hospital inpatient resources than non-Medicaid patients. This difference in resource use can largely be explained by differences in patient characteristics. The finding that the case mix adjustment explained the majority of this resource use difference ($1,000 out of the $1,135 total charge difference, see Table 2 on page 2) provides such evidence.

The fact that Medicaid patients had substantially lower ancillary charges than non-Medicaid patients ($1,590 less per case), even after adjusting for case mix differences ($1,185 less per case), suggests that their medical condition was less severe on average than non-Medicaid patients. This difference may be due to Medicaid patients' lower average age. However, Medicaid patients had higher routine hospital charges ($486 more per case), which were doubled after being adjusted by case mix ($1,014). This difference is largely explained by the concomitant longer length of stay among Medicaid patients.

These findings suggest one potential opportunity for cost containment for Medicaid. Mas-

sachusetts may be able to achieve Medicaid cost savings by reducing hospital length of stay, especially through more effectively managing mental health/substance abuse cases. Medicaid patients must be moved out of the hospital to outpatient services and other non-hospital settings earlier. If Medicaid patients' routine charges are reduced to the same level as non-Medicaid patients, i.e. $486 per case less, the Commonwealth could potentially achieve a 6% saving on its Medicaid hospital inpatient expenditures. If similar savings could be achieved at the case mix adjusted level, i.e. $1,014 per case less, it would represent a 10% saving on Medicaid hospital inpatient expenditures.

Finally, one caveat of this study should be highlighted. Using hospital charges to represent resource use has its limitations. Some additional hospital resource use associated with Medicaid patients are likely not reflected in hospital charges, such as social services, language interpretation, and additional administrative costs.

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1. This includes both acute and non-acute hospitals, but does not consider Medicaid managed care capitation payment. Medicaid expenditures are based on FY01 data from the Massachusetts Division of Medical Assistance.
2. Hospital revenue sources were based on the FY00 403 Hospital Cost Report data from the Massachusetts Division of Health Care Finance and Policy.
3. The mean of total charges per case was $10,436 with a standard deviation of $22,645. The average total charges per case for the excluded 1,159 Medicaid cases were $155,488 and $155,649 for the excluded 4,465 non-Medicaid cases. The difference is not statistically significant.
4. The Case Mix Index is the average DRG cost weights for Medicaid cases or for non-Medicaid cases respectively. The DRG cost weights were developed by Massachusetts Division of Health Care Finance and Policy with Version 12 DRG Grouper and FY99 Massachusetts weights. The information on DRG specific hospital cases was based on FY99 hospital discharge data.

Analysis in Brief

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